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(56) Documents Cited

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(54) Abstract Title

Improvements in doors for lockable storage containers

(57) A lockable storage container comprises a door frame 1 for at least one outwardly openable door 4 which is hinged to the frame about an axis spaced from the adjacent side of the frame so that a gap is formed between the adjacent edges of the door and frame and a flange 11 running along the edge of the door cooperates with a complementary projection 12 or recess on/in the frame to seal the gap when the door is closed. The door may be supported by pivots extending into recesses in its upper and lower edges and rotatable washers 9 may surround the pivots to prevent sawing through the pivots.

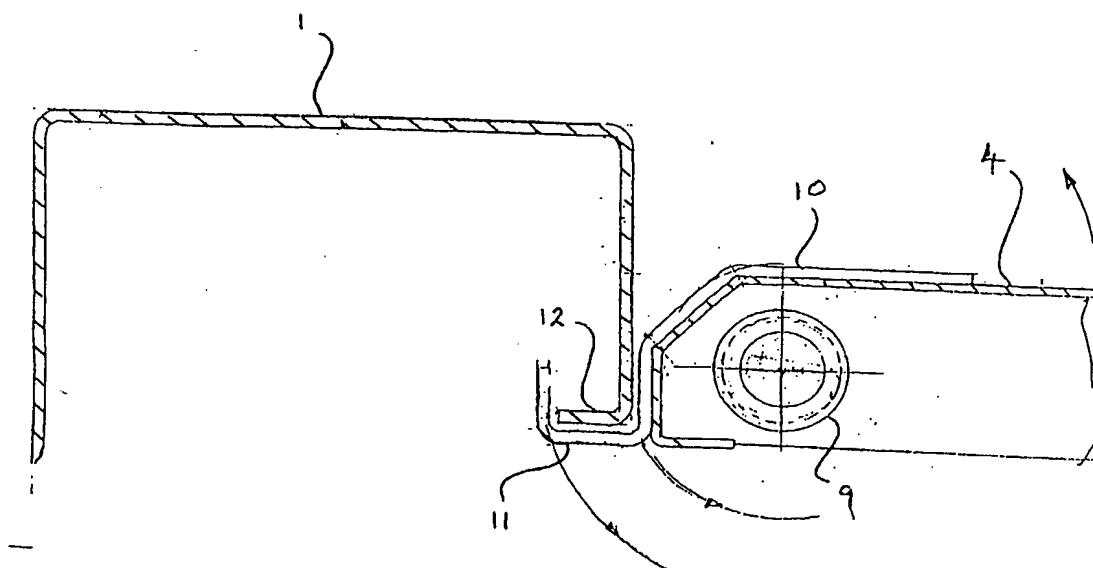


FIGURE 2

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.  
The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.  
The print reflects the state of the application at the time the claims were filed.

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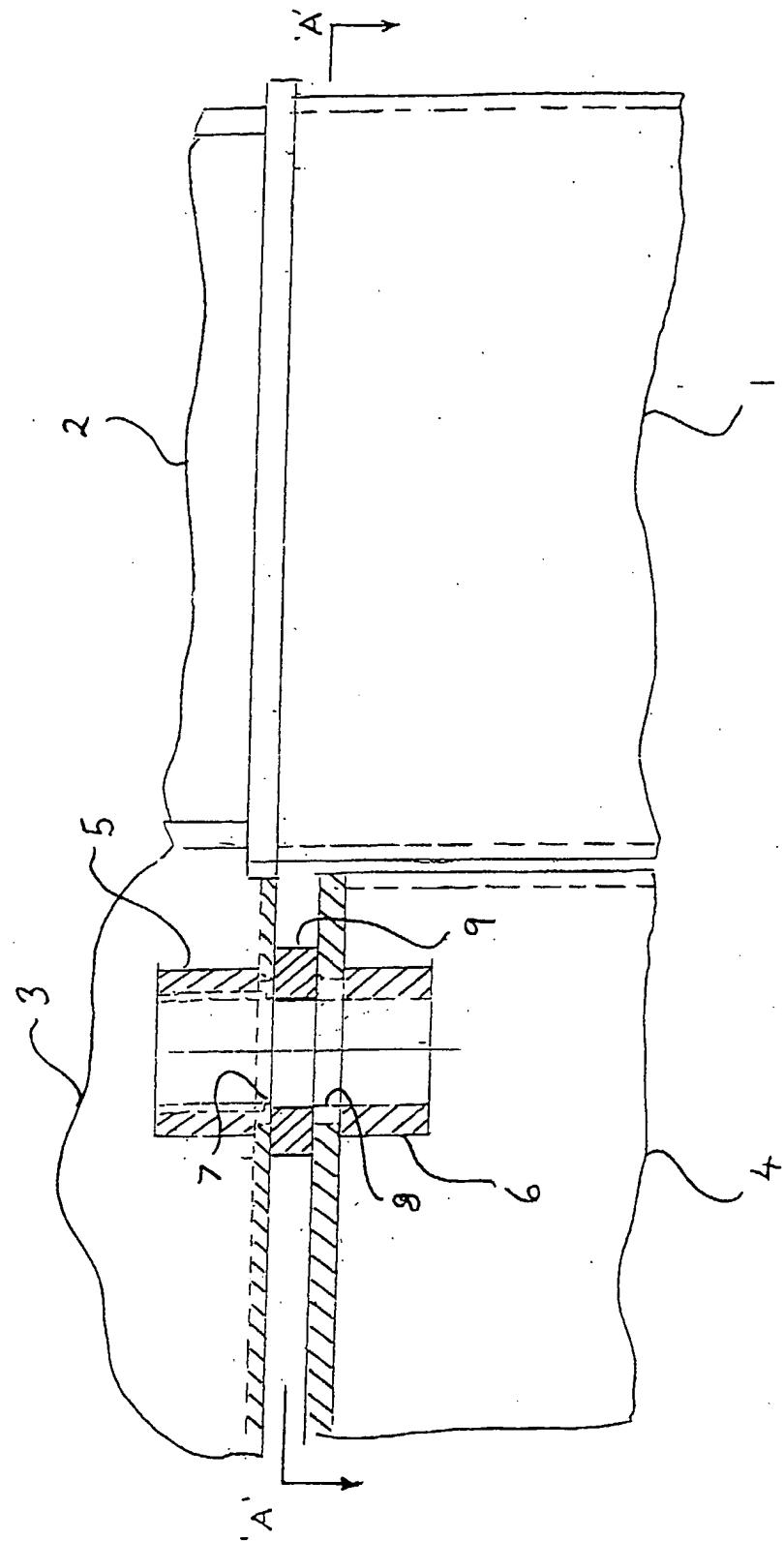


FIGURE 1

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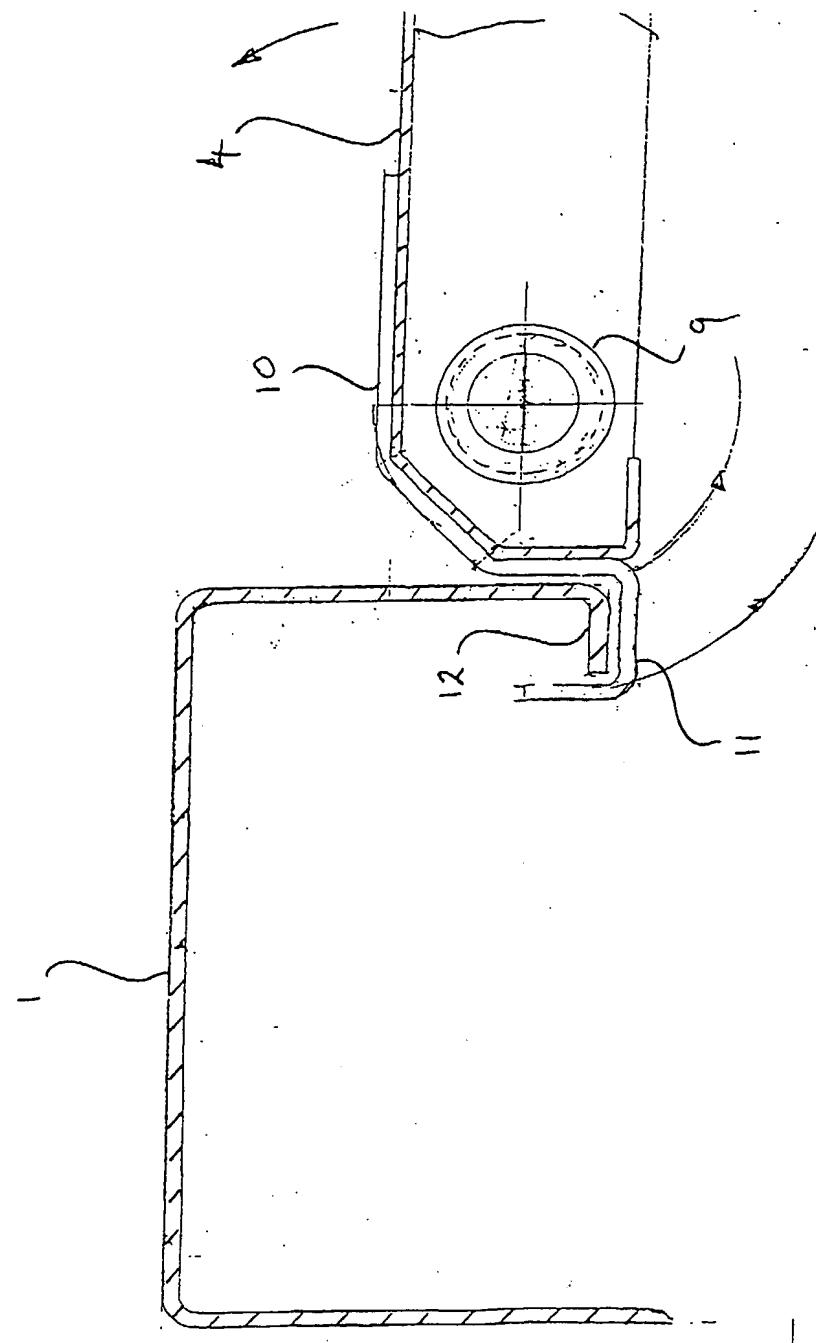


FIGURE 2

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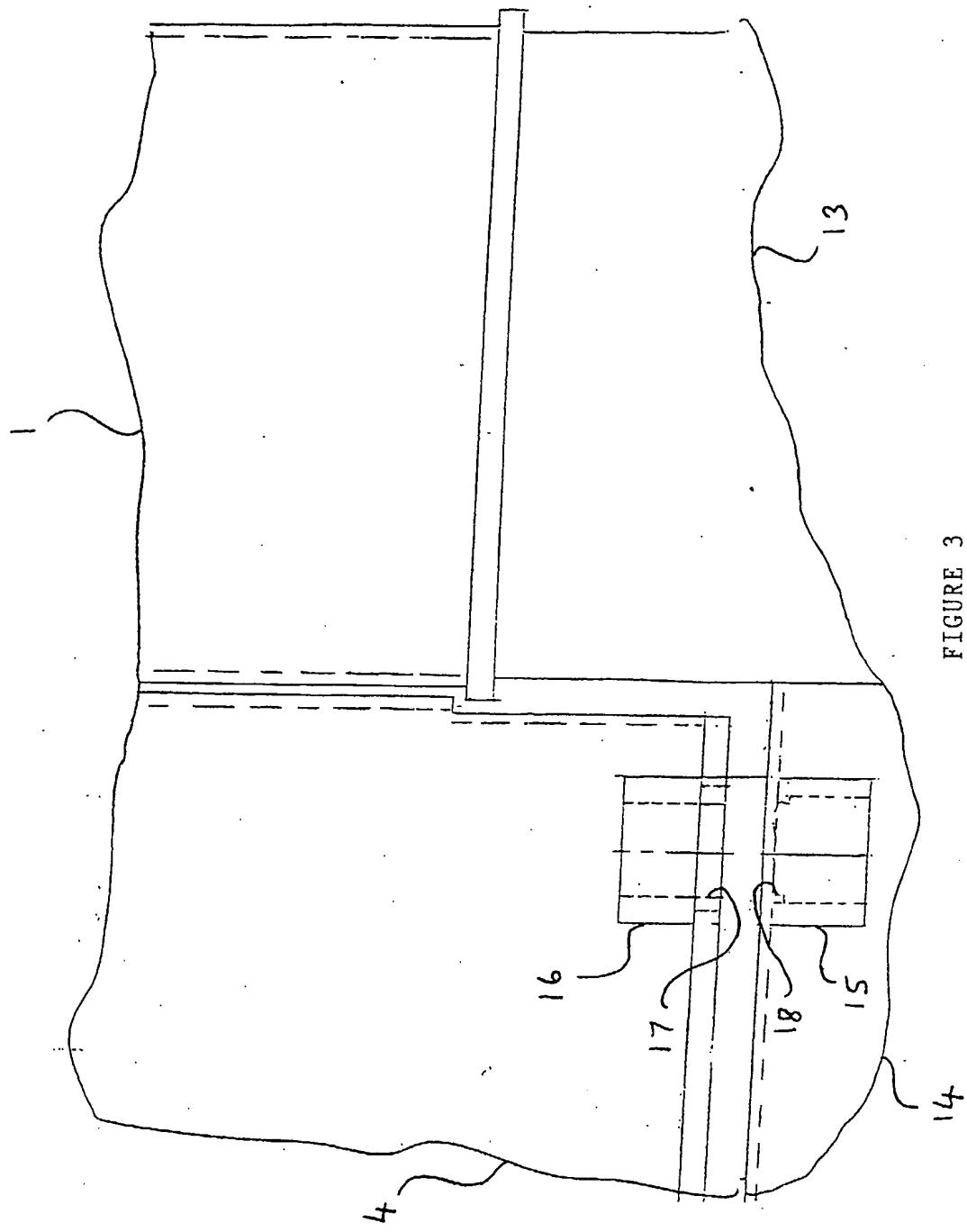


FIGURE 3

IMPROVEMENTS IN AND RELATING TO LOCKABLE  
STORAGE CONTAINERS

5        This invention relates to lockable storage containers  
of the type which are transportable to e.g. building sites  
in order to store materials and equipment.

10      It is well known that such storage containers are  
often the target of thieves or vandals, particularly when  
the building site concerned is unattended during the night-  
time and at weekends. Such containers usually have two  
outwardly openable doors at one end, and so one technique  
of accessing the contents thereof is to slide a crowbar or  
15     some other such implement into the gap between a door where  
it is hinged to the frame of the storage container.

20      In GB2245017, there is shown an anti-tamper hinge  
system in which access to the hinge itself is prevented by  
means of a metal shield which overlays the hinge when the  
door is closed. Because the shield is necessarily secured  
to the front of the door in the region of the hinge in each  
case, and extends to the side of the hinge also, it is  
therefore necessary to mount the hinge and shield within a  
25     channel which is sufficiently wide to accommodate the  
hinge, the shield and allow rotation of the shield about  
the hinge, thereby leaving a large gap into which may be

inserted a crowbar or, very often, the flattened end of a piece of scaffolding bar (Putlock bar). Although this hinge system is still an improvement over known storage containers with exposed hinges, nevertheless it still suffers from the aforementioned disadvantage.

5

It is an object of the present invention to provide a lockable storage container in which access to the space between the doors on the sides of the containers on which they are hinged is minimised. It is a further object of the present invention to provide a lockable storage container in which the doors can be easily removed and refitted if necessary.

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According to the invention there is provided a lockable storage container comprising or including a rectilinear opening defining a door frame for at least one outwardly openable door, the or each door being hinged for swivelling movement about an axis spaced from a respective side of the door frame such that upon outward swivelling of the or each door a gap is present between the door and the respective side of the door frame representative of the distance between the swivel axis and the side of the door frame, and a flange running along the inside length of the or each door adjacent to the side of the door frame and

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being co-operable with a correspondingly shaped projection or recess on or in the door frame such that upon closure of the or each door the flange interlocks with the projection or recess, as the case may be, to seal the gap there  
5 between.

This design of hinge mechanism prevents the doors from being pushed inwards or pulled outwards even if the hinges are tampered with, such as by being sawn through, for  
10 reasons as are explained below.

Preferably, the or each door is swivellably mounted between a pair of pins or bolts extending into oppositely disposed coaxial ferrules on or in the door frame, each  
15 bolt or pin being receivable within a correspondingly shaped recess within respectively upper and lower ends of the door, which recesses may conveniently comprise ferrules. Preferably, in the case of bolts being used to extend through to the ferrules on or in the door frame,  
20 such may conveniently be threaded such that each such bolt may be releasably locked in place by e.g. a spanner, and unlocked accordingly.

The advantage of this arrangement will be apparent in that removal and refitting of a door simply requires the removal of the bolts, or pins, as the case may be.

5 Conveniently, the gap between upper and lower edges of the door and upper and lower edges of the door frame around the pivot axis is occupied by a hardened washer or shim surrounding each bolt or pin in this region, thereby preventing or inhibiting the use of a hacksaw blade to cut  
10 through the bolt or pin, as the case may be.

As stated previously, the design of the mechanism by which the doors are opened and closed means that they cannot be removed even if the hinge bolts or pins are sawn through because of the interlocking relationship between the or each flange and its correspondingly shaped projection or recess on or in the door frame, which therefore prevents removable of the or each door. Similarly, because the or each door typically rests within recesses at the top and bottom of the container it is therefore also not possible to push the doors inwards to gain entry.  
20

25 The invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 shows a cut out view partly in cross section of the upper part of a storage container and an attendant door;

5           Figure 2 is a corresponding view to that of Figure 1 showing a lower part of the storage container and attendant door; and

Figure 3 is a sectional plan view along the line "A - A" of Figure 1.

10

Referring firstly to Figure 1 there is shown part of the upper right hand corner of a storage container which comprises an upright pillar 1, top corner block 2 and top beam or lintel 3, all collectively defining part of a frame 15 for receiving a door 4 in a conventional manner.

The lintel 3 includes a threaded ferrule 5 secured, such as by welding, to be coaxial with a corresponding but unthreaded ferrule 6 extending into the door 4, again being secured such as by welding. Through bores 7, 8 in the 20 lintel 3 and door 4 respectively therefore provide access for a threaded bolt (not shown) to be inserted within the ferrule 6 to be thereafter releasably bolted onto the threaded ferrule 5 by the use of, typically, a spanner.

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Between the ferrules 5, 6 is disposed a case hardened washer or shim 9 for preventing or inhibiting the use of e.g. a hacksaw blade from cutting through a bolt used to secure the door 4 to the lintel 3, it being understood that 5 the washer 9, at least in the configuration shown in Figure 1, would be rotatable about the bolt as well, thereby increasing the difficulty of cutting through the bolt.

In Figure 2 there is shown a cross-section along the 10 lines "A"- "A" of Figure 1 except that in this view there is shown mounted on the door 4, such as by welding, a flange plate 10 having on one end thereof a generally "U" shaped flange 11 defining a channel within which is received a generally "L" shaped corner portion 12 of the upright 15 pillar 1.

From Figure 2 it will be apparent that the door 4 is opened by swivelling movement thereof in the direction arrowed about an axis coincident with the major axis of the 20 ferrules 5, 6 and washer 9.

Part of the lower right hand corner of the storage container is shown in Figure 3 in which the upright pillar 1 is shown connected to a bottom corner block 13 and a 25 bottom beam 14. The bottom beam 14 also includes a

threaded ferrule 15 mounted coaxial with an unthreaded ferrule 16 in the door 4, each of the ferrules 15, 16 again allowing the insertion of a threaded bolt by the provision of through bores 17, 18 in, respectively, the lower part of  
5 the door 4 and upper part of the beam 14.

As will be apparent, particularly from Figure 2, the provision of the flange 11 for receiving the generally "L" section portion 12 of the upright pillar 1 effectively  
10 prevents a through gap between the door 4 and the pillar 1, thereby preventing or inhibiting the use of a jemmy or other such implement to force open a gap between the door 4 and upright pillar 1. In addition, because the flange 11, in the embodiment shown, is generally "U" shaped it will be  
15 apparent that the free end of the flange plate 10 in this region acts to essentially prevent the "L" shaped portion of the upright pillar 1 from being forced away from the door 4 by the use of e.g. a jemmy. In addition, although a gap is shown between the flange plate 10 and the upright  
20 pillar 1 in the drawing, it will be apparent that this gap may be minimised or even eliminated by suitable machining and by the use of a suitable profile, such as a partially round profile, for the door 4.

A further benefit of the invention is derived from the use of bolts which engage with the ferrules 6, 7 and 15, 16 in the manner as described, since the removal and refitting doors is therefore more easily facilitated than with the use of conventional hinges. Although threaded bolts are the preferred option, nevertheless it will be apparent that pins may also be used, in which case they may be retained in their respective positions by the use of split pins or spring-action quick release pins extending through transverse bores running through their free ends, thereby obviating the need for the use of a spanner.

The invention therefore provides a relatively simple but effective way of increasing the difficulty presented to thieves and such like in attempting to gain access to such storage containers whilst at the same making it easier for doors to be removed and refitted.

CLAIMS

1. A lockable storage container comprising or including a rectilinear opening defining a door frame for at least one outwardly openable door, the or each door being hinged for swivelling movement about an axis spaced from a respective side of the door frame such that upon outward swivelling of the or each door a gap is present between the door and the respective side of the door frame representative of the distance between the swivel axis and the side of the door frame, and a flange running along the inside length of the or each door adjacent to the side of the door frame and being co-operable with a correspondingly shaped projection or recess on or in the door frame such that upon closure of the or each door the flange interlocks with the projection or recess, as the case may be, to seal the gap therebetween.

2. A lockage storage container according to claim 1 further characterised in that the or each door is swivellably mounted between a pair of pins or bolts extending into oppositely disposed coaxial ferrules on or in the door frame, each bolt or pin being receivable within a correspondingly shaped recess within respectively upper and lower ends of the door.

3. A lockable storage container according to claim 1 or  
claim 2 further characterised in that each bolt or pin is  
provided with a hardened washer or shim in the gap between  
5 upper and lower edges of the door and upper and lower edges  
of the door frame around the pivot axis thereof.

4. A lockable storage container including an anti-tamper  
hinge substantially as hereinbefore described with  
10 reference to the drawings.

5. An anti-tamper hinge substantially as hereinbefore  
described with reference to the drawings.